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THE UNDERSIGNED HEREBY RESPECTFULLY REQUESTS ACCESS TO THE FILE HISTORY OF THE FOLLOWING ABANDONED APPLICATION WHICH WAS REFERRED TO IN U.S. PATENT NUMBER 5266683 OR PRINTED APPLICATION _____.

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United States Patent [19]

Oppermann et al.

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[45] Date of Patent: * Nov. 30, 1993

[54] OSTEOGENIC PROTEINS

[75] Inventors: Hermann Oppermann, Medway; Engin Ozkaynak, Milford; Thangavel Kuberasampath, Medway; David C. Rueger, Hopkinton; Roy H. L. Pang, Medway, all of Mass.

[73] Assignee: Stryker Corporation, Kalamazoo, Mich.

[*] Notice: The portion of the term of this patent subsequent to Nov. 2, 2010 has been disclaimed.

[21] Appl. No.: 841,646

[22] Filed: Feb. 21, 1992

Related U.S. Application Data

[60] Continuation-in-part of Ser. No. 827,052, Jan. 28, 1992, Pat. No. 5,250,302, Ser. No. 579,865, Oct. 7, 1990, Pat. No. 5,108,753, Ser. No. 621,849, Dec. 4, 1990, abandoned, Ser. No. 621,988, Dec. 4, 1990, abandoned, Ser. No. 810,560, Dec. 20, 1991, abandoned, Ser. No. 569,920, Aug. 20, 1990, abandoned, Ser. No. 600,024, Oct. 18, 1990, abandoned, Ser. No. 599,543, Oct. 18, 1990, abandoned, Ser. No. 616,374, Nov. 21, 1990, Pat. No. 5,162,114, and Ser. No. 483,913, Feb. 22, 1990, Pat. No. 5,171,574, said Ser. No. 827,052, is a division of Ser. No. 179,406, Apr. 8, 1988, Pat. No. 4,968,590, said Ser. No. 579,865, is a division of Ser. No. 179,406, Apr. 8, 1988, said Ser. No. 621,849, is a division of Ser. No. 232,630, Aug. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 179,406, Aug. 15, 1988, said Ser. No. 621,988, is a division of Ser. No. 315,342, Feb. 23, 1989, Pat. No. 5,011,691, which is a continuation-in-part of Ser. No. 232,630, Feb. 23, 1989, said Ser. No. 810,560, is a continuation of Ser. No. 660,162, Feb. 22, 1991, abandoned, which is a continuation of Ser. No. 422,699, Oct. 17, 1989, abandoned, which is a continuation-in-part of Ser. No. 315,342, Oct. 17, 1989, said Ser. No. 569,920, is a continuation-in-part of Ser. No. 422,699, Oct. 17, 1989, and Ser. No. 483,913, Oct. 17, 1989, which is a continuation-in-part of Ser. No. 422,613, Oct. 17, 1989, Pat. No. 4,975,526, which is a continuation-in-part of Ser. No. 315,342, Oct. 17, 1989, said Ser. No. 600,024, is a continuation-in-part of Ser. No. 569,920, Oct. 17, 1989, said Ser. No. 599,543, is a continuation-in-part of Ser. No. 569,920, Oct. 17, 1989.

[51] Int. Cl.[5] A61K 37/02; C07K 5/00; C07K 7/00; C07K 15/00

[52] U.S. Cl. 530/326; 530/327; 530/328; 530/350; 530/395; 530/840

[58] Field of Search 530/326, 327, 328, 395, 530/840, 300, 350

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Primary Examiner—Nathan M. Nutter
Attorney, Agent, or Firm—Testa, Hurwitz & Thibeault

[57] ABSTRACT

Disclosed are (1) osteogenic devices comprising a matrix containing substantially pure natural-sourced mammalian osteogenic protein; (2) DNA and amino acid sequences for novel polypeptide chains useful as subunits of dimeric osteogenic proteins; (3) vectors carrying sequences encoding these novel polypeptide chains and host cells transfected with these vectors; (4) methods of producing these polypeptide chains using recombinant DNA technology; (5) antibodies specific for these novel polypeptide chains; (6) osteogenic devices comprising these recombinantly produced proteins in association with an appropriate carrier matrix; and (7) methods of using the osteogenic devices to mimic the natural course of endochondral bone formation in mammals.

58 Claims, 47 Drawing Sheets